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Ramsey's theorem and self-complementary graphs. (In English)

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A graph G is called s-good if neither G nor its complement contains a complete graph with $s+1$ vertices. By Ramsey's theorem, given any s there is the least integer $n(s)$ such that no graph with more than $n(s)$ vertices is s-good. Let $n^*(s)$ be the largest number of vertices of a self- complementary s-good graph. Then $n^*(s) \leq n(s)$. One has $n^*(2) = n(2) = 5$ and $n^*(3) = n(3) = 17$; perhaps $n^*(s) = n(s)$ for all s. The authors prove $n^*(st) \geq (n^*(s)-1)n(t)$; in particular, $n^*(2t) \geq 4n(t)$. The last inequality together with an earlier exponential lower bound on $n(s)$, due to Erdős, yields an exponential lower bound on $n^*(s)$. An application to Shannon's notion of a capacity of G is mentioned.

Classification:
05C99 Graph theory
05C35 Extremal problems (graph theory)